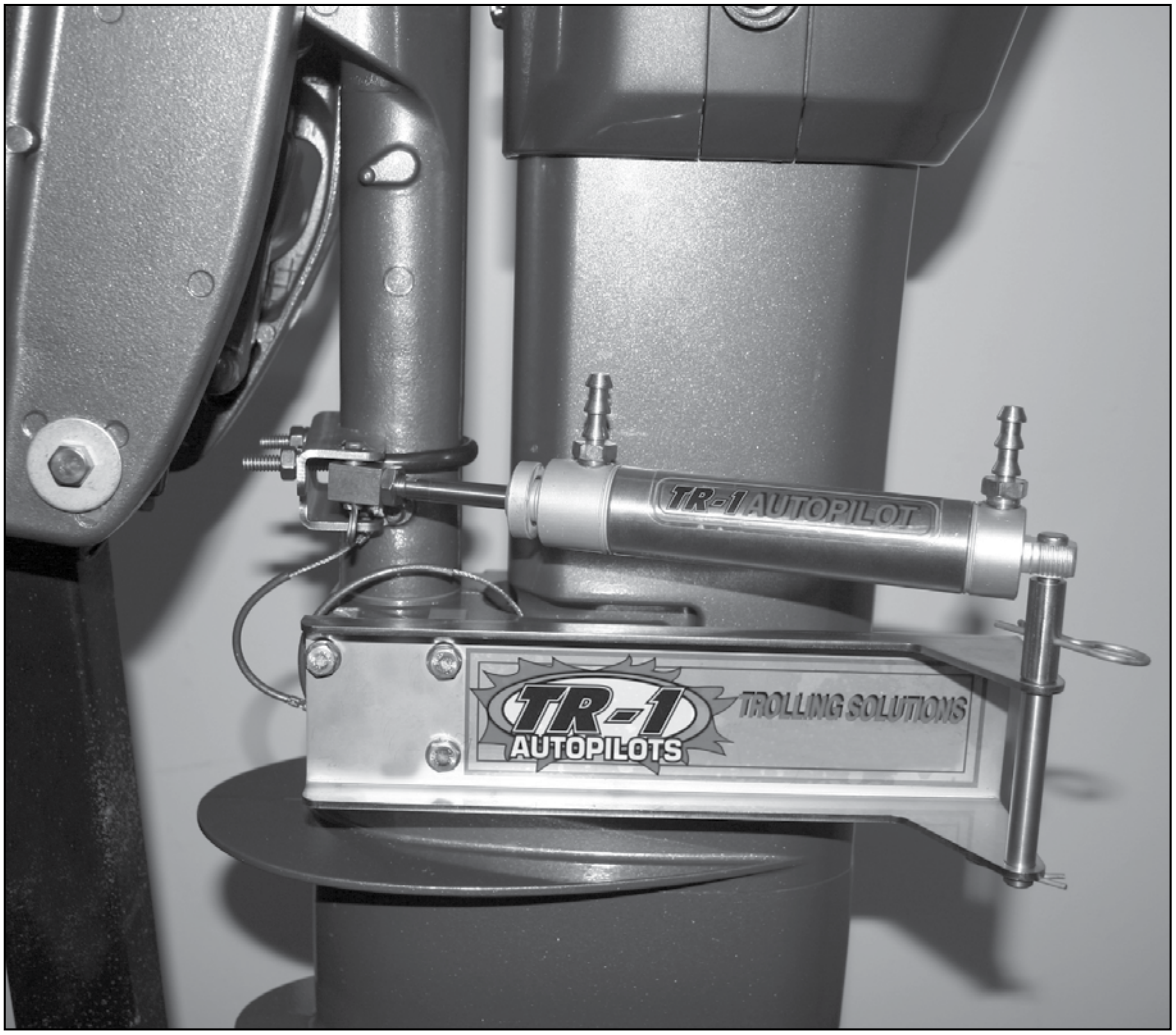
GARMIN™

TR-1 Gold

Cylinder and Bracket Mounting Instructions

Yamaha 9.9 HP
2008 and Newer



PN 906-1040-10

I. Installing the Cylinder & Mounting Bracket

Tools Required:
One; #1 (small) Phillips Screw Driver
One; Wrench ½ In.
One; Wrench 7/16 In.
One; Wrench 10 MM
One; 10 MM Socket Wrench
Thread lock (Loctite or similar (not shown)

Figure 2

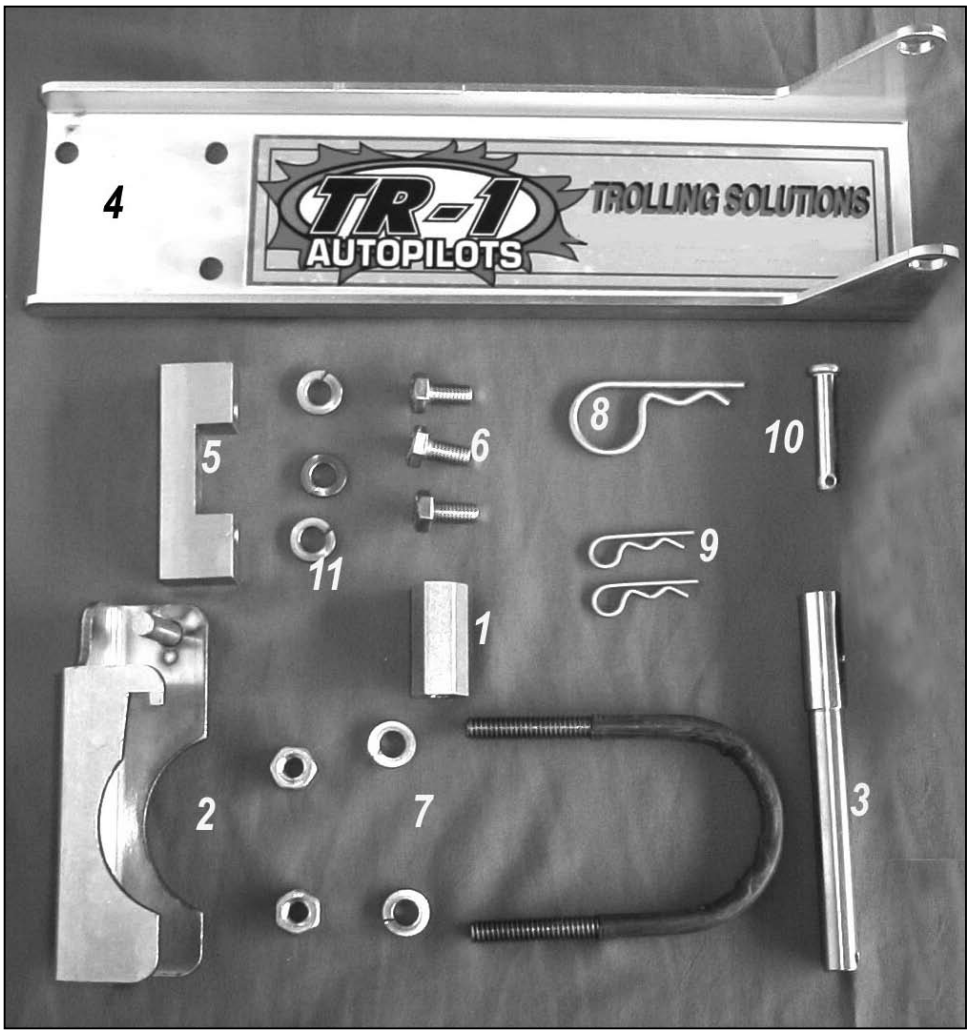


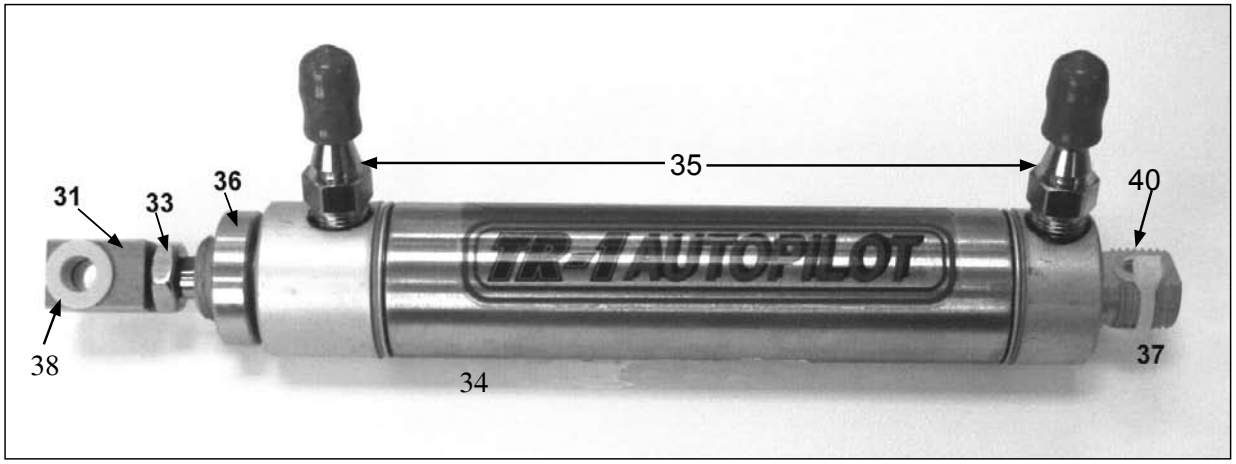
Figure 3

Cylinder Kit PN 120-1040-10

ITEM	PART NUMBER	QTY.	NAME
1	330-1045-00	1	Nut, Standoff
2	130-1042-00	1	Bracket, Rod Eye Mounting
3	330-1013-00	1	Pin, Stern Pivot
4	380-1044-00	1	Channel, Cylinder MTG.
5	380-1046-00	1	Plate, Standoff Nut
6	310-0206-12	3	Hex Cap M6 X 12 MM
7	130-0084-00	1	“U” Bolt 1 3/4” ID 1/4-20
8	310-0067-01	1	Hair Pin Cotter LG.
9	310-0067-02	2	Hair Pin Cotter Med.
10	310-2501-25	1	Clevis Pin 1/4 D. X 1.25
11	310-0076-25	5	LW Split 1/4

Cylinder Kit 120-0900-00

ITEM	PART NO.	QTY	NAME
31	330-1002-00	1	Rod Eye, 5/16-24
33	310-0042-09	1	Hex Jam Nut 5/16-24
34	340-0900-00	1	Cylinder
35	321-0001-00	2	Fitting, Straight 1/8 NPT X 1/4
36	330-1101-00	1	Zinc Anode (Replaceable)
37	310-0040-26	1	Washer, Flat, Nylon 1/4 ID X .03
38	328-0901-00	2	Bushing 1/4 ID X 5/16 OD X 1/4"L
40	328-0902-00	1	Cylinder Tail Bushing



Installation of cylinder and bracket kit

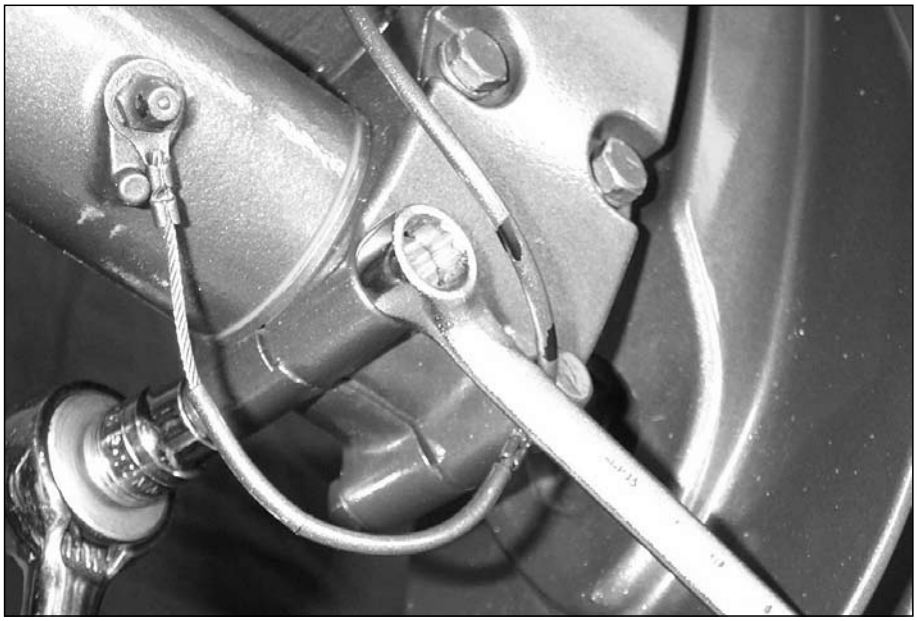


Figure 5

Step One:

Turn the steering friction lock on the motor (just above the clamps and below the front grip) all the way to the left. (Full free steering rotation. See motor manual if necessary.) The motor must steer very freely for the autopilot to work. If there is still any drag in the steering loosen the nut that is controlled by the friction lever to eliminate it. Tip the motor to the up latched position. (Or full up with the power tilt.) Remove the upper front bolt and nut from the top front of the lower motor vibration isolation mounting shroud. Be advised, we have seen the bolts enter from different sides on different motors.

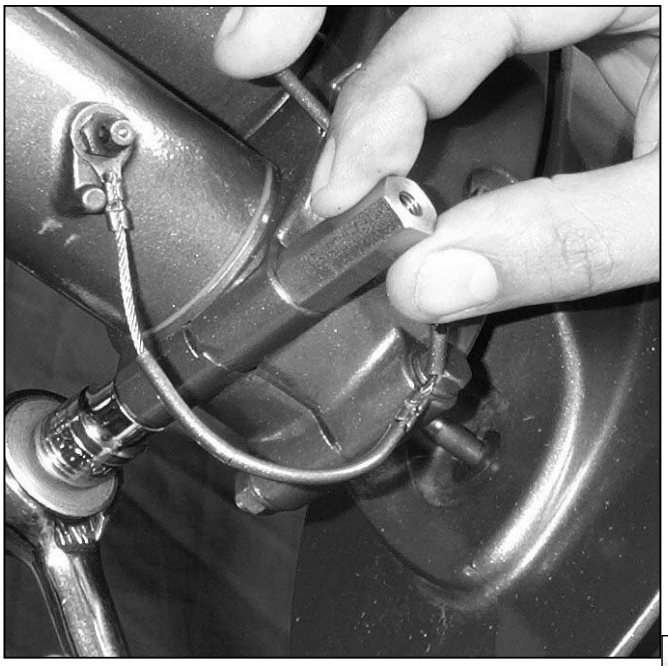


Figure 6

Step Two:

Install the bolt you just removed into the same hole from the starboard side of the motor to the port side. Put a little thread lock on the protruding end of the bolt. Thread the bolt's end in to the Standoff Nut (*item 1*) as shown in figure 6 and tighten the it.

Step Three:

Remove the two rear bolts from the lower motor vibration isolation mounting shroud as shown in figure 7.

Figure 7

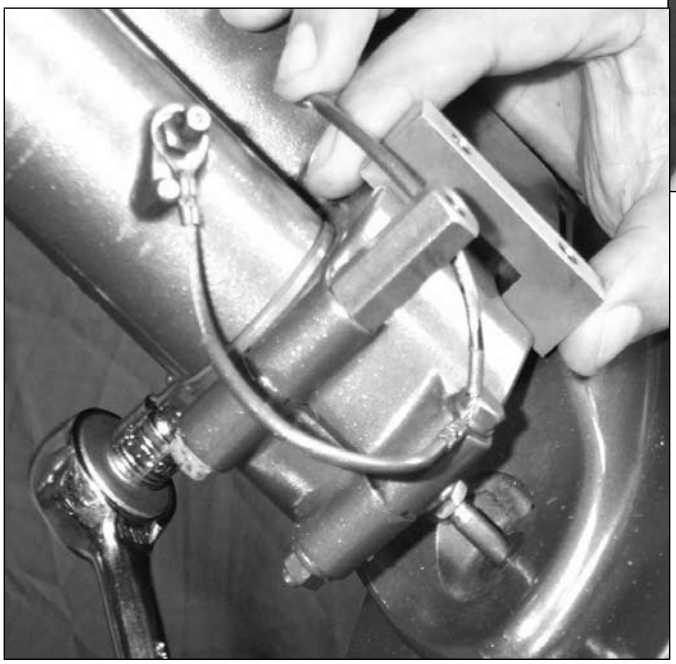


Figure 8

Step Four:

Again, install the bolts you just removed into the same holes from the starboard side of the motor to the port side. Put a little thread lock on the protruding ends of the bolts. Thread the bolts into non-flat side of the Standoff Nut Plate (*item 5*) as shown in figure 8 and tighten the them.

Figure 9

Step Five:

Slide the small end of the Stern Pivot Pin (*item 3*) through the holes at the rear of both flanges. Secure the Pivot Pin in place by inserting a Medium Hair Pin Cotter (*item 9*) through the hole below the bottom flange, as shown in figure 11.

Hold the Cylinder (*item 34*) with the Fittings (*item 35*) up (toward the top of the motor).

Figure 11

Step Four:

Put a little thread lock on the ends of the three 6 MM Hex CAP Screws (*item 6*) and install them through one Lock Washer each (*item 11*) and then the Cylinder Mounting Channel (*item 4*) and into the Standoff Nut and Plate (*items 1 & 5*) as shown in figure 9. (*Channel with the label facing you right side up.*) Keep the Channel perpendicular to the motor down shaft and tighten the Screws.

Figure 10

Line the hole in rear end cap of the Cylinder (*item 34*) with the hole in the top of the Stern Pivot Pin (*item 3*). Slide the Clevis Pin (*item 10*) through the cylinder tail bushing (*item 40*) (you may cut the zip tie now) and into the top hole of the Stern Pivot Pin. Line up the cross holes and put the Large Hair Pin Cotter (*item 8*) through the cross holes in both Pins as shown in figure 10.

NOTE: If for any reason you need to disconnect the steering actuator, pulling the large Hair Pin Cotter and Clevis Pin will disconnect them quickly.

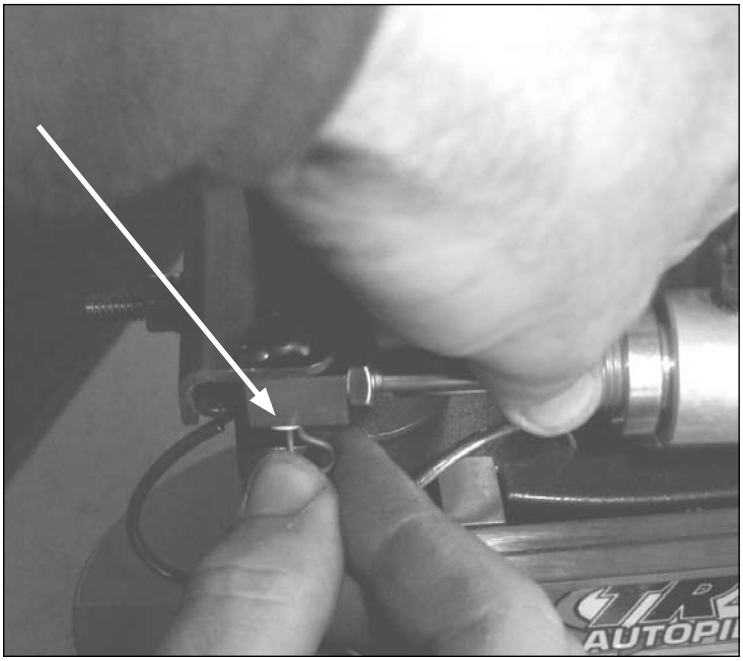


Figure 12

Step Six:

Place pin in the Rod Eye Mounting Bracket (*item 2*) through the cylinder Rod Eye (*item 31*) as shown. (*Leave the cylinder attached.*) Install the last Medium Hair Pin Cotter (*item 9*) through the hole in the Bracket pin as shown in figure 12.

Step Seven:

Turn the motor to the hard to port (prop full to the left side of the boat) position. This will push the cylinder rod fully into the cylinder. Remove the nuts from the "U" Bolt and install it around the motor steering down tube above the grease fitting. Keeping the cylinder fully retracted and the motor full to port, line up the Rod Eye Mounting Bracket (*item 2*) against the motor steering down tube with the "U" bolt through it. The several models of motor have differences in the location of the grease fitting relative to the shock mount (shaft length). This causes the Rod Eye Mounting Bracket to have to be mounted with the lower flange notch around the grease fitting on some models and about a 1/4 inch below it on others. Raise and lower the rod end of the cylinder against the pins holding it at the rear to rind the center of its free travel. That will indicate where to locate the Rod Eye Mounting Bracket along steering down tube. The Rod Eye Bracket should, also, always end up with the channel parallel to the transom of the boat. Put a little thread lock on the protruding screw ends of the "U" Bolt. Mount and tighten the last two Lock Washers (*item 11*) and the "U" Bolt Nuts, as shown.in figure 13. *Note: The grounding wire around the grease fitting may need to be rotated out of the way. In the future if you wish to remove or install a cylinder. Just remove the Clevis Pin at the rear and slide the Rod Eye (item 31) off the Rod Eye Bracket pin after removing the cotters. This will leave the bracket in place.*

Figure 13

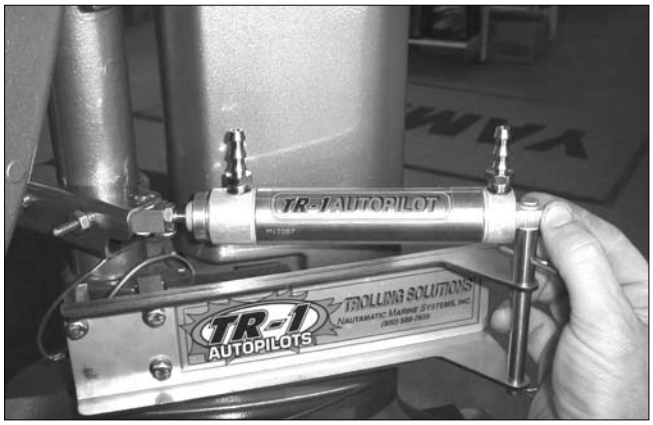


Figure 14

Figure 15

Step Eight:

Turn the motor hard over to port Figure 14. That will retract the Cylinder rod into the Cylinder. Check that the Cylinder rod is still free to retract at least a little more. Next turn the motor hard over to starboard Figure 15. That will extend the Cylinder rod out of the Cylinder. Check that the Cylinder rod is still free to extend at least a little more. It should have additional travel in both directions. If it does not adjust the position of the Rod Eye (*item 31*) on the Cylinder shaft. The Cylinder shaft should turn with your fingers if the Hex Jam Nut (*item 33*) is loose. (*If the shaft does not turn freely enough, use a thin 1/4 Inch open end wrench at the shaft's wrench flats.*) Do not use any tool on the cylindrical part of the Cylinder shaft. If the shaft gets scratched, bent, or dinged the seal will fail. With the cylinder properly adjusted, secure it by tightening the Hex Jam Nut against the Rod Eye after putting a little thread lock between them. It is ready for plumbing. We suggest you put the original parts in a container and, carefully store them. (*You may eventually want to sell or trade in your motor, but we know you will want to keep your TR-1 Autopilot.*)